What is claimed is:

1. A method comprising:

   determining an overrun in the encoding of an input bitstream;

   determining the severity of the overrun; and

   encoding a current frame using at least one catch-up mode to process the

   overrun.

2. The method of claim 1 wherein encoding occurs without skipping a frame of

   the input bitstream.

3. The method of claim 1 further comprising:

   determining an anticipated finishing time for the encoding.

4. The method of claim 3 wherein determining the severity of the overrun is

   based upon the anticipated finishing time.

5. The method of claim 1 wherein determining the overrun occurs before

   encoding a next frame.

6. The method of claim 1 wherein a subsequent overrun does not occur during

   the catch-up processing.

7. The method of claim 1 wherein a plurality of catch-up modes are available to speed-up encoding of the bitstream.

8. The method of claim 1 wherein the catch-up mode contains a plurality of rate control processes.

9. A system comprising:

    a catch-up controller to determine an overrun in the encoding of an input bitstream and to determine the severity of the overrun; and

    an encoder to encode a current frame using at least one catch-up mode to process the overrun.

10. The system of claim 9 wherein the encoder encodes the input bitstream without skipping a frame of the input bitstream.

11. The system of claim 9 wherein the encoder further determines an anticipated finishing time for the encoding.

12. The system of claim 11 wherein the encoder determines the severity of the overrun based upon the anticipated finishing time.

13. The system of claim 9 wherein the encoder determines the overrun before encoding a next frame.

14. The system of claim 9 wherein a subsequent overrun does not occur during the catch-up processing.

15. The system of claim 9 wherein a plurality of catch-up modes are available to speed-up encoding of the bitstream.

16. The system of claim 9 wherein the catch-up mode contains a plurality of rate control processes.

17. The system of claim 16 wherein each of the plurality of rate control processes avoids quality loss of the bitstream.

18. The system of claim 9 wherein the encoder uses a plurality of catch-up modes to produce short catch-up times and good catch-up quality.

19. A system comprising:

    means for determining an overrun;

    means for determining the severity of the overrun; and

    means for encoding a current frame using at least one catch-up modes to process the overrun.

20. A computer readable medium comprising instructions, which when executed on a processor, perform a method for timeshifting the encoding and decoding of a bitstream, the system comprising:

means for determining an overrun;

means for determining the severity of the overrun; and

means for encoding a current frame using at least one catch-up modes to
process the overrun.